

## MEMS-Enabled Smart Reconfigurable Antennas, Phase II

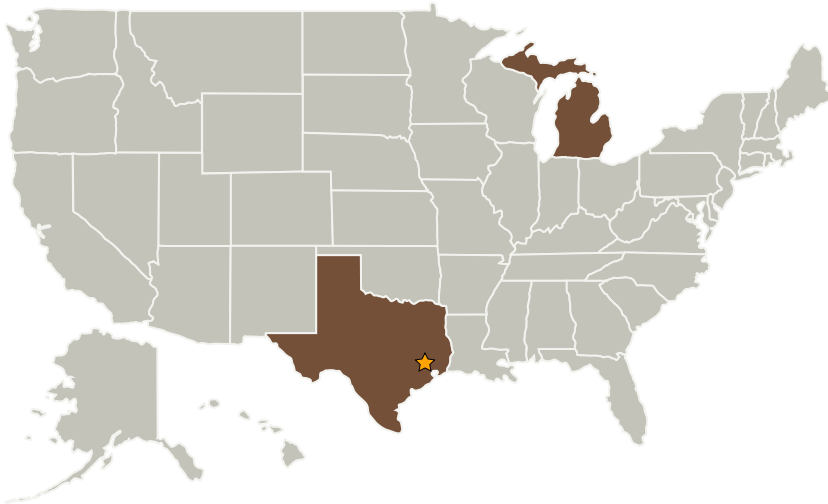
Completed Technology Project (2009 - 2011)



## Project Introduction

A prototype wearable smart reconfigurable antenna for the Suit will be built to be used during NASA's EVA operations on lunar surface. The design is based on the Self-Structuring Antenna (SSA) technology utilizing MEMS switches for configuration of the aperture. Electrothermally and electrostatically actuated MEMS were studied via modeling and experiments and electrostatically actuated switches were recommended for use in Phase II due to their low actuation power requirements. The proposed smart antenna offers both adaptive beam steering and MIMO options for increasing the signal to noise ratio (SNR) and extending range. The antenna provides enhanced RF link for surface-to-surface voice, data, and video communication while also supporting contingency voice communication with the Lunar Relay Satellites (LRS). The technology is expected to reach TRL of 6 at the end of Phase II.

## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Virtual EM Inc.	Supporting Organization	Industry	Ann Arbor, Michigan



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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Johnson Space Center (JSC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

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### Primary U.S. Work Locations

Michigan

Texas

### Project Transitions



**June 2009:** Project Start



**September 2011:** Closed out

### Project Management

#### Program Director:

Jason L Kessler

#### Program Manager:

Carlos Torrez

### Technology Areas

#### Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - └ TX05.2 Radio Frequency
    - └ TX05.2.6 Innovative Antennas